

Remarks

The final Office Action mailed February 28, 2007 has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-20 are now pending in this application. Claims 1-6 stand rejected. Claims 7-20 are newly added. No new matter has been added.

The rejection of Claim 1 under 35 U.S.C. § 102(b) as being anticipated by Ramos Fernandez et al. (U.S. Patent 5,592,031) (hereinafter referred to as “Ramos Fernandez”) is respectfully traversed.

Ramos Fernandez describes a switching system for high voltage pulses of high instantaneous current. The system includes a power source (V_P), three polarization circuits, a main switching channel (A-B), and a current switch (CBT). The power source (V_P) polarizes the main switching channel (A-B). Each polarization circuit is coupled between the power source (V_P) and the main switching channel (A-B) and includes a resistor (R_1 , R_2 , or R_3) and an inductor (L_1 , L_2 , or L_3). The main switching channel (A-B) includes two rectifier sets (GR_1 and GR_2) conductive in opposite directions and a capacitor (C_1) coupled to each rectifier set (GR_1 or GR_2). The rectifier sets (GR_1 and GR_2) are each formed using a diode network (RD_1 and RD_2 , respectively). When the current switch (CBT) is open, the switching system provides a high impedance to a bipolar signal (V_1 and V_2). When the current switch (CBT) is closed, the switching system provides switching for a high voltage current.

Claim 1 recites an ultrasonic diagnostic apparatus for transmitting ultrasonic signals from ultrasonic transducers toward a subject to be examined, and receiving reflected waves of said ultrasonic signals for display, comprising “an analog switch for switching ultrasonic transducers for transmission of said ultrasonic signals and reception of said reflected waves; a transmitter power source comprising a regulator circuit coupled to a power source for supplying a high voltage to a transmitter circuit for causing said ultrasonic transducers to drive said ultrasonic signals, said regulator circuit comprising a capacitor, a diode, a resistor, and an inductor; and a bias power source generating circuit for generating a bias power source for said analog switch from said transmitter power source.”

Ramos Fernandez does not describe nor suggest an ultrasonic diagnostic apparatus as recited in Claim 1. More specifically, Ramos Fernandez does not describe nor suggest an

ultrasonic diagnostic apparatus that includes a transmitter power source having a regulator circuit coupled to a power source for supplying a high voltage to a transmitter circuit for causing ultrasonic transducers to drive ultrasonic signals. Further, Ramos Fernandez does not describe nor suggest a regulator circuit that includes a capacitor, a diode, a resistor, and an inductor. Rather, Ramos Fernandez describes a high-voltage switching system that includes a main switching channel having two opposite conducting diode-network rectifier sets each coupled to a capacitor. A description in Ramos Fernandez of two diode-network rectifier sets does not describe or suggest an ultrasonic diagnostic apparatus that includes a transmitter power source having a regulator circuit coupled to a power source, wherein the regulator circuit includes a capacitor, a diode, a resistor, and an inductor.

Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Ramos Fernandez.

For at least the reasons set forth above, Applicant respectfully requests that the Section 102 rejection of Claim 1 be withdrawn.

The rejection of Claims 1, 2, 4, and 6 under 35 U.S.C. § 103(a) as being unpatentable over Barnes et al. (U.S. Patent 6,795,374) (hereinafter referred to as “Barnes”) in view of Ramos Fernandez is respectfully traversed.

Ramos Fernandez is described above. Barnes describes a medical diagnostic ultrasound system (10) that controls bias voltage for an electrostatic transducer array (16). The system (10) includes a DC power supply (100) to generate a bias voltage for each electrostatic transducer element (68). A transmit bias voltage and a reception bias voltage are supplied to each element (68) such that the reception bias voltage is higher than the transmit bias voltage. In a first embodiment, each element (68) is coupled to a plurality of voltage inputs such that a first bias voltage (DC Bias 1) is applied to an element (68) during a transmit mode, and a second bias voltage (DC Bias 2) is applied to the element during a reception mode. In another embodiment, a single bias power source is controlled by a digital-to-analog converter (DAC) (70) to control the transmit bias voltage and the reception bias voltage. Barnes further describes controlling the transmit bias voltage and the reception bias voltage using switches (82 and 84) and resistors (76, 78, 80) to alter the bias voltage applied to the element (68). The transmit bias voltage and the reception bias voltage may also be controlled with a trigger signal (30 or 50) coupled to a bias voltage (36 or 56).

Claim 1 recites an ultrasonic diagnostic apparatus for transmitting ultrasonic signals from ultrasonic transducers toward a subject to be examined, and receiving reflected waves of said ultrasonic signals for display, comprising “an analog switch for switching ultrasonic transducers for transmission of said ultrasonic signals and reception of said reflected waves; a transmitter power source comprising a regulator circuit coupled to a power source for supplying a high voltage to a transmitter circuit for causing said ultrasonic transducers to drive said ultrasonic signals, said regulator circuit comprising a capacitor, a diode, a resistor, and an inductor; and a bias power source generating circuit for generating a bias power source for said analog switch from said transmitter power source.”

Neither Barnes nor Ramos Fernandez, considered alone or in combination, describes or suggests an ultrasonic diagnostic apparatus as recited in Claim 1. More specifically, neither Barnes nor Ramos Fernandez, considered alone or in combination, describes or suggests an ultrasonic diagnostic apparatus that includes a transmitter power source having a regulator circuit coupled to a power source for supplying a high voltage to a transmitter circuit for causing ultrasonic transducers to drive ultrasonic signals. Further, neither Barnes nor Ramos Fernandez, considered alone or in combination, describes or suggests a regulator circuit that includes a capacitor, a diode, a resistor, and an inductor. Rather, Barnes describes a medical diagnostic ultrasound system that applies a transmit bias voltage and a different reception bias voltage to an electrostatic transducer element, and Ramos Fernandez describes a high-voltage switching system that includes a main switching channel having two opposite conducting diode-network rectifier sets each coupled to a capacitor.

Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Barnes in view of Ramos Fernandez.

Claims 2, 4, and 6 depend from independent Claim 1. When the recitations of Claims 2, 4, and 6 are considered in combination with the recitations of Claim 1, Applicant submits that dependent Claims 2, 4, and 6 likewise are patentable over Barnes in view of Ramos Fernandez.

In addition, Applicant respectfully submits that the Section 103 rejection of Claims 1, 2, 4, and 6 is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been obvious to one of ordinary skill in the art to modify the medical diagnostic ultrasound system of Barnes with the high-voltage switching system of Ramos

Fernandez to arrive at the present invention. As explained by the Federal Circuit, “to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the Applicant.” In re Kotzab, 54 USPQ2d 1308, 1316 (Fed. Cir. 2000); MPEP 2143.01.

Further, as is well established, the mere fact that the prior art structure could be modified does not make such a modification obvious unless the prior art suggests the desirability of doing so. See In re Gordon, 221 USPQ2d 1125 (Fed. Cir. 1984). The Federal Circuit has determined that:

[i]t is impermissible to use the claimed invention as an instruction manual or “template” to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that “[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.

In re Fritch, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992). Further, under Section 103, “it is impermissible . . . to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.” In re Wesslau, 147 USPQ 391, 393 (CCPA 1965). Rather, some suggestion to combine such references and a reasonable expectation of success must both be found in the prior art, and not based on Applicant’s disclosure. In re Vaeck, 20 USPQ2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the cited art, or any reasonable expectation of success has been shown.

Specifically, there is no suggestion or motivation within Barnes or Ramos Fernandez to combine Ramos Fernandez with Barnes to produce the claimed invention. Accordingly, since there is neither a teaching nor a suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicant respectfully requests that the Section 103 rejection of Claims 1, 2, 4, and 6 be withdrawn.

For at least the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claims 1, 2, 4, and 6 be withdrawn.

The rejection of Claims 3, 5, and 6 under 35 U.S.C. § 103(a) as being unpatentable over Barnes in view of Ramos Fernandez, and in view of Sato et al. (U.S. Patent 5,469,484) (hereinafter referred to as “Sato”) is respectfully traversed.

Barnes and Ramos Fernandez are described above. Sato describes a solid-state imaging system that includes a charge-coupled device (CCD) (1). To supply a voltage (V_{sub}) to the substrate (22) of the CCD (1), a substrate voltage setting circuit (17) is provided. An operation voltage of the substrate voltage setting circuit (17) is provided through a charge pumping type booster circuit (16). Two voltage sources, a positive-polarity (VH) voltage source (6) and a negative-polarity (VL) voltage source (7), are coupled to the booster circuit (16) to produce a boosted output voltage to serve as the operation voltage of the substrate voltage setting circuit (17). The booster circuit (16) includes two capacitors (C1 and C2) and four switches (SW1, SW2, SW3, and SW4). More specifically, a first switch (SW1) is coupled between the first capacitor (C1) and a ground line. A second switch (SW2) is coupled between the first capacitor (C1) and the VL voltage source (7). A third and a fourth switch (SW3 and SW4) are coupled between the two capacitors (C1 and C2). The output end of the second capacitor (C2) is coupled to the substrate voltage setting circuit (17). When the opening and closing of the switches (SW1, SW2, SW3, and SW4) are timed, the boosted output voltage is equal to the absolute value of VH plus the absolute value of VL.

Claims 3, 5, and 6 depend from independent Claim 1, which recites an ultrasonic diagnostic apparatus for transmitting ultrasonic signals from ultrasonic transducers toward a subject to be examined, and receiving reflected waves of said ultrasonic signals for display, comprising “an analog switch for switching ultrasonic transducers for transmission of said ultrasonic signals and reception of said reflected waves; a transmitter power source comprising a regulator circuit coupled to a power source for supplying a high voltage to a transmitter circuit for causing said ultrasonic transducers to drive said ultrasonic signals, said regulator circuit comprising a capacitor, a diode, a resistor, and an inductor; and a bias power source generating circuit for generating a bias power source for said analog switch from said transmitter power source.”

None of Barnes, Ramos Fernandez, and Sato, considered alone or in combination, describes or suggests an ultrasonic diagnostic apparatus as recited in Claim 1. More specifically, none of Barnes, Ramos Fernandez, and Sato, considered alone or in combination, describes or suggests an ultrasonic diagnostic apparatus that includes a

transmitter power source having a regulator circuit coupled to a power source for supplying a high voltage to a transmitter circuit for causing ultrasonic transducers to drive ultrasonic signals. Further, none of Barnes, Ramos Fernandez, and Sato, considered alone or in combination, describes or suggests a regulator circuit that includes a capacitor, a diode, a resistor, and an inductor. Rather, Barnes describes a medical diagnostic ultrasound system that applies a transmit bias voltage and a different reception bias voltage to an electrostatic transducer element, Ramos Fernandez describes a high-voltage switching system that includes a main switching channel having two opposite conducting diode-network rectifier sets each coupled to a capacitor, and Sato describes a booster circuit that aggregates the absolute value of two input voltages into an output voltage via capacitors and timed switches.

Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Barnes in view of Ramos Fernandez, and in view of Sato.

When the recitations of Claims 3, 5, and 6 are considered in combination with the recitations of Claim 1, Applicant submits that dependent Claims 3, 5, and 6 likewise are patentable over Barnes in view of Ramos Fernandez, and in view of Sato.

In addition, Applicant respectfully submits that the Section 103 rejection of Claims 3, 5, and 6 is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been obvious to one of ordinary skill in the art to modify the medical diagnostic ultrasound system of Barnes with the high-voltage switching system of Ramos Fernandez with the voltage aggregating booster circuit of Sato to arrive at the present invention. As explained by the Federal Circuit, “to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the Applicant.” In re Kotzab, 54 USPQ2d 1308, 1316 (Fed. Cir. 2000); MPEP 2143.01.

Further, as is well established, the mere fact that the prior art structure could be modified does not make such a modification obvious unless the prior art suggests the desirability of doing so. See In re Gordon, 221 USPQ2d 1125 (Fed. Cir. 1984). The Federal Circuit has determined that:

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use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.

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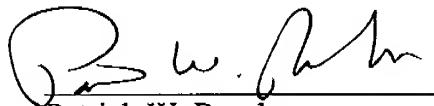
Specifically, there is no suggestion or motivation within any of Barnes, Ramos Fernandez, and/or Sato to combine Barnes, Ramos Fernandez, and/or Sato to produce the claimed invention. Accordingly, since there is neither a teaching nor a suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicant respectfully requests that the Section 103 rejection of Claims 3, 5, and 6 be withdrawn.

For at least the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claims 3, 5, and 6 be withdrawn.

Newly added Claims 7-20 depend, directly or indirectly, from independent Claim 1, which Applicant respectfully submits is patentable over the cited art. For at least the reasons set forth above, Applicant respectfully submits that Claims 7-20 are also patentable over the cited art.

In view of the foregoing amendment and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



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